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VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1927–28

By George Arceneaux, *Agent*, and F. D. Stevens, *Associate Agronomist, Office of Sugar Plants, Bureau of Plant Industry* [1]

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INTRODUCTION

Experimental work conducted by the United States Department of Agriculture in Louisiana with new varieties of sugarcane during the crop seasons of 1925–26 and 1926–27 [2, 3] indicated that under prevailing disease conditions the three varieties released for general planting, P. O. J. 36, P. O. J. 213, and P. O. J. 234,[4] were distinctly superior to the varieties previously planted in Louisiana and gave promise of restoring the industry to its previous level of production. The recommendations made as a result of these experiments and previous investigations by the department met a ready response from the planters, and the available seed was propagated to such an extent that plantings of the above-named varieties constituted approximately 85 per cent of the 1927–28 sugarcane acreage in Louisiana.

The results of the large-scale plantings have fully substantiated experimental findings, and, in general, the new varieties have met the expectations of the planters. Janes [5] in his preliminary report estimates the average yield of sugarcane per acre and the average yield of sugar per ton of cane for the 1927–28 crop to be considerably above the 10-year average. The figures given indicate an increase of more than 33 per cent in pounds of sugar per acre over and above the average for 10 years.

[1] Acknowledgment is made to R. D. Rands, senior pathologist, and Sidney F. Sherwood, senior biochemist, Office of Sugar Plants, for cooperation in these investigations.

[2] Rands, R. D., and Sherwood, S. F. YIELD TESTS OF DISEASE-RESISTANT SUGAR CANES IN LOUISIANA. U. S. Dept. Agr. Circ. 418, 20 p., illus. 1927.

[3] Rands, R. D., Sherwood, S. F., and Stevens, F. D. SUGAR-CANE VARIETY TESTS IN LOUISIANA DURING THE CROP YEAR 1926–27. U. S. Dept. Agr. Circ. 36, 15 p. 1928.

[4] An explanation of the abbreviations used to designate sugarcane varieties appears as a footnote to Table 2, p. 5.

[5] Janes, L. L. PRELIMINARY SUGAR, SIRUP, AND MOLASSES REPORT FOR LOUISIANA, SEASON 1928. U. S. Dept. Agr., Bur. Agr. Econ. [Mimeographed report.]

To a marked extent the results have reestablished confidence in the sugar industry, and the planter's credit has correspondingly improved.

Table 1 summarizes a sugarcane acreage study made on 22 representative Louisiana sugarcane plantations. On the basis of this study, it will be noted that approximately 97 per cent of the 1928–29 crop will consist of new varieties.

TABLE 1.—*Percentage of the acreage of 22 representative Louisiana plantations planted to various varieties of sugarcane for two seasons*

Variety	1927–28 crop		1928–29 crop	
	Acreage	Percentage	Acreage	Percentage
P. O. J. 36	1,846	7.26	4,608	13.28
P. O. J. 213	3,514	13.82	11,740	33.83
P. O. J. 234	16,192	63.69	17,328	49.93
Old varieties	3,872	15.23	1,028	2.96
Total	25,424	100.00	34,704	100.00

With reference to the relative proportions of the acreage in the three "new varieties," it will be noted that P. O. J. 234 still holds the lead, though it shows a relative decrease. P. O. J. 213 shows the largest increase.

During the crop year of 1927–28 comparative studies were continued on such varieties as had shown promise in past experiments. The results are summarized in this report.

SEASONAL CONDITIONS

The year 1928 was characterized by an abnormally late spring. The month of April was much cooler than normal, the mean departure for Houma being −4.9° and that for the entire State −4.0°. This naturally resulted in late germination and suckering, particularly in the case of varieties such as P. O. J. 213, which require comparatively high temperatures for germinating. A period of frequent showers which occurred at Houma and at Greenwood in the fall delayed ripening and rather accentuated the damaging effects of the somewhat abnormal freeze on December 9. In spite of these conditions, however, it is generally felt that the new varieties stood up remarkably well.

The absence of unduly severe winds and of flood damages during the year, together with the fact that the borer infestation was one of the lightest in years, rendered conditions comparatively favorable for field experimentation.

EXPERIMENTAL METHODS

PLOT ARRANGEMENT

The system of plot arrangement used, which is essentially the same as that used in the 1925–26 and 1926–27 variety test plots, is illustrated in Figure 1. This consists of a regular arrangement of the varieties, insuring that each one will appear next to every other one

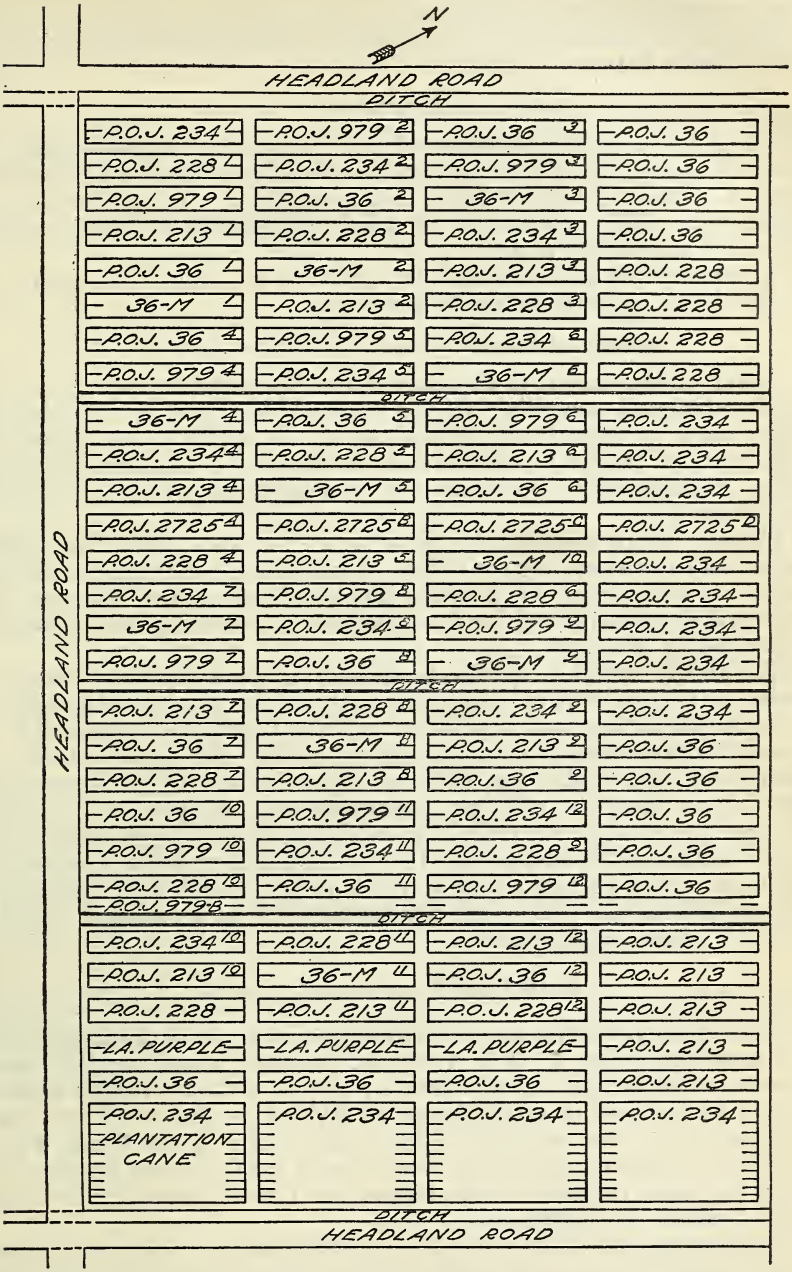

FIGURE 1.—Plot of the cooperative sugarcane variety test planted October 31, 1927, on sandy-loam soil at the Greenwood plantation, Thibodaux, La. The plots were 18 by 121 feet in size, or one-twentieth of an acre

practically the same number of times. This arrangement greatly increases the reliability of the comparisons by minimizing differences due to factors such as differences in soil, fertility, drainage, and also those due to "border effect" resulting from differences in growth and competition between varieties.

SAMPLING

Duplicate samples consisting of five stools each (approximately 90 pounds) were collected for preliminary analyses, and at harvest one 5-stool sample was taken from each replication. In assembling the sample an effort was made to select representative stools evenly distributed over the plot.

The cane was then crushed by means of a 3-roller mill giving an extraction of approximately 60 per cent.

SUGAR CALCULATIONS AND STATISTICAL METHODS

Sugar yields, except in the case of the Raceland factory mill data, were calculated according to the method described by Rands and Sherwood, by the Winter-Carp (Java) formula, using factor for polarization (sucrose) = 0.920, factor for Brix = 0.954, assumed normal juice extraction = 78 per cent, and boiling-house efficiency number = 100 per cent.

Except where considerable differences in plot-weight variability appeared to exist among the different varieties, a generalized probable error for differences in average yields of sugarcane between the varieties was determined for the experiments according to the method described by Richey.[6]

Variability studies on chemical-analysis data indicate that the sampling system used in connection with most of the harvest analyses (12 samples of five stools each from each variety) made it possible to measure differences in sucrose content of 0.27 per cent in terms of laboratory-mill results, but the data regarding extraction figures and the factors used to convert laboratory-mill analyses to probable normal juice values as applied to the different varieties is insufficient at present to justify an attempt to determine the probable significance of differences in calculated sugar yields between varieties. However, there is definite evidence that the sugar yields as calculated afford a reliable basis of comparison.

PLANT-CANE VARIETAL TESTS

Plant-cane varietal tests were conducted at the four test fields with the most promising P. O. J. varieties, including the three that have been released for general plantation planting and such others as have shown indications of adaptability as judged by the results of past experiments. The variety Co. 281 and certain of the Canal Point seedling varieties which had shown good performance in previous tests were also included in the test at the United States Sugar-Plant Field Station at Houma, La.

In planting and cultivating the experimental plots the usual plantation practices were followed. At the Erath test field an 8:8:8[7]

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[6] RICHEY, F. D. THE MOVING AVERAGE AS A BASIS FOR MEASURING CORRELATED VARIATION IN AGRONOMIC EXPERIMENTS. Jour. Agr. Research 32: 1161–1175. 1926.

[7] Eight per cent P_2O_5, 8 per cent NH_3, and 8 per cent K_2O.

fertilizer mixture was applied in April at the rate of 200 pounds per acre. At the United States Sugar-Plant Field Station, Houma, La., a 4:12:4 mixture was applied on March 28 at the rate of 400 pounds per acre. No fertilizer was used on the plant cane at the other test fields.

The sugarcane yield data and the sugar-yield calculations based on laboratory-mill results for the plant-cane tests at the five test fields are summarized in Tables 2, 3, 4, 5, and 6.

TABLE 2.—*Results of plant-cane variety tests on mixed soil at the United States Sugar-Plant Field Station, Houma, La., in 1928*

Variety [1]	Acre yield of cane (tons) [2]										
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Average
P. O. J. 36	34.62	35.12	36.74	33.98	36.92	------	------	------	------	------	35.48
P. O. J. 36-M	37.34	36.56	40.50	39.56	33.72	------	------	------	------	------	37.54
P. O. J. 213	------	------	------	------	------	41.52	35.06	39.54	38.80	31.18	37.22
Co. 281	22.68	31.92	24.66	22.00	------	------	------	------	------	------	25.31
C. P. 71-B	------	------	------	------	------	34.42	37.78	34.32	38.58	29.96	35.01
C. P. 123	------	------	------	------	------	32.30	30.24	28.10	27.96	26.00	28.92
C. P. 177	37.04	40.28	41.10	42.20	45.28	45.10	40.14	39.42	41.00	37.92	40.95
C. P. 807	56.26	49.42	47.08	52.76	48.80	------	------	------	------	------	50.86
U. S. 1444	------	------	------	------	------	39.18	38.90	36.14	30.94	32.44	35.52

Variety	Laboratory-mill juice analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Analyses Nov. 1			Harvest analyses Nov. 16			Analyses Dec. 13 [3]					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
										Lbs.	*Lbs.*	*Tons*
P. O. J. 36	12.90	8.58	66.51	13.38	9.28	69.36	13.47	9.13	67.78	111.2	3,945	18.0
P. O. J. 36-M	13.68	9.65	70.54	14.70	10.59	72.04	14.85	11.11	74.82	130.4	4,895	15.3
P. O. J. 213	13.10	9.13	69.69	13.82	10.34	74.82	14.04	10.84	77.21	130.7	4,865	15.3
Co. 281	13.15	8.93	67.91	14.37	10.52	73.21	14.74	10.92	74.09	131.1	3,318	15.3
C. P. 71-B	14.82	11.27	76.04	15.40	11.78	76.49	14.92	11.29	75.67	151.1	5,290	13.2
C. P. 123	12.84	8.81	68.61	13.58	9.71	71.50	13.05	9.18	70.35	119.0	3,441	16.8
C. P. 177	13.50	9.06	67.11	14.12	9.94	70.40	13.52	9.43	69.75	120.4	4,930	16.6
C. P. 807	13.10	9.35	71.37	13.82	10.18	73.66	13.58	9.71	71.50	127.5	6,485	15.7
U. S. 1444	13.38	8.44	63.08	13.96	9.51	68.12	13.37	8.97	67.09	112.5	3,996	17.8

[1] Many varieties of sugarcane are commonly designated by letters or other abbreviations indicating the origin of the seedling cane. The meanings of such designations for the varieties mentioned throughout this circular are as follows: Co.=Coimbatore (India) seedling; C. P.=Canal Point (Fla.) seedling; F. M.=Formosa Male seedling; P. O. J.=Proefstation Oest Java seedling; P. O. J. 36-M=Mingka selection of P. O. J. 36; U. S.=U. S. Department of Agriculture, best selections from Canal Point seedlings.

[2] Tons of 2,000 pounds.

[3] Average of eight 5-stool samples. One plot of each variety was left standing for deterioration studies.

TABLE 3.—*Results of plant-cane variety tests on light soil on the Godchaux plantation, Raceland, La., in 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±0.47 ton]

Variety	Acre yield of cane (tons) [1]												
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Average
P. O. J. 36	27.56	27.23	24.58	28.61	29.73	30.57	30.89	31.70	27.07	26.58	26.92	25.86	28.11
P. O. J. 36-M	27.38	29.36	23.48	27.05	27.21	32.75	32.24	31.42	31.42	25.88	27.60	------	28.71
P. O. J. 213	33.65	34.16	27.96	32.10	33.71	37.30	37.59	32.53	34.71	30.22	28.33	29.35	32.63
P. O. J. 228	26.82	28.17	23.84	28.06	29.40	27.10	30.04	30.55	28.60	25.62	25.49	26.30	27.50
P. O. J. 234	21.65	25.16	23.58	25.79	26.85	24.92	24.10	24.74	23.77	25.70	24.19	22.02	24.37
P. O. J. 979	26.44	27.68	22.73	27.40	25.60	31.45	28.20	24.05	28.60	27.89	26.57	26.60	26.93

Variety	Laboratory-mill juice analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses Oct. 27			Preliminary analyses Nov. 8			Harvest analyses Nov. 21			Per ton of cane	Per acre	
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity			
										Pounds	*Pounds*	*Tons*
P. O. J. 36	12.60	8.53	67.70	14.05	10.40	74.02	15.07	11.47	76.11	146.6	4,121	13.6
P. O. J. 36-M	14.15	10.60	74.92	14.65	11.07	75.57	15.98	12.64	79.10	165.5	4,752	12.1
P. O. J. 213	13.25	9.43	71.17	13.25	9.80	73.96	15.45	12.56	81.29	167.2	5,456	12.0
P. O. J. 228	12.30	8.02	65.20	13.05	9.04	69.27	15.06	11.32	75.16	143.4	3,943	13.9
P. O. J. 234	15.30	12.00	78.44	15.55	12.32	79.23	16.73	13.81	82.49	185.5	4,521	10.8
P. O. J. 979	13.15	8.46	64.33	13.90	9.50	68.35	15.85	11.88	74.96	150.5	4,053	13.3

[1] Tons of 2,000 pounds.

TABLE 4.—*Results of plant-cane variety tests on light soil on the Greenwood plantation, Thibodaux, La., in 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties = ±0.64 ton]

Variety	Acre yield of cane (tons) [1]												
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Average
P. O. J. 36	27.19	25.98	27.13	28.24	28.11	33.76	28.68	36.22	33.34	29.90	30.18	34.43	30.26
P. O. J. 36-M	27.05	30.61	30.17	31.65	27.21	33.00	34.98	32.63	30.37	28.19	33.19	------	30.82
P. O. J. 213	33.20	30.56	32.77	35.58	38.00	32.80	35.55	37.35	39.42	35.85	35.83	33.60	35.04
P. O. J. 228	32.15	31.25	27.84	34.77	31.71	34.22	35.54	31.58	35.09	31.00	34.30	30.30	32.48
P. O. J. 234	26.08	26.20	29.01	27.59	25.76	25.32	27.31	28.49	27.38	24.36	24.66	27.59	26.65
P. O. J. 979	25.90	27.22	26.90	27.59	29.38	32.00	35.96	26.94	36.77	29.25	34.10	30.60	30.22
P. O. J. 2725	------	------	------	------	------	------	------	------	------	25.39	27.68	24.39	25.82
Louisiana Purple	------	------	------	------	------	------	------	------	------	------	------	------	15.73

Variety	Laboratory-mill juice analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses Oct. 29			Preliminary analyses Nov. 9			Harvest analyses Nov. 30			Per ton of cane	Per acre	
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity			
										Lbs.	*Lbs.*	*Tons*
P. O. J. 36	11.30	6.73	59.56	12.20	8.00	65.57	13.46	9.28	68.94	110.8	3,353	18.1
P. O. J. 36-M	12.80	8.72	68.13	13.70	9.82	71.71	14.45	10.44	72.25	128.7	3,967	15.5
P. O. J. 213	12.95	8.59	66.59	13.10	9.37	71.53	14.11	10.51	74.47	132.5	4,643	15.1
P. O. J. 228	11.55	6.39	55.32	12.60	8.26	65.56	13.30	8.83	66.39	102.3	3,323	19.6
P. O. J. 234	14.30	10.24	71.61	14.55	11.03	75.81	15.33	12.11	78.99	158.4	4,221	12.6
P. O. J. 979	12.80	7.95	62.11	13.05	8.35	64.02	14.20	9.46	66.81	109.8	3,318	18.2
P. O. J. 2725	10.95	6.22	56.80	11.60	7.05	60.82	12.68	8.09	63.80	90.6	2,339	22.1
Louisiana Purple	12.15	7.61	62.63	12.45	8.19	65.78	13.30	9.15	68.80	109.1	1,716	18.3

[1] Tons of 2,000 pounds.

TABLE 5.—*Results of plant-cane variety tests on light soil on the Cypremort plantation, Louisa, La., in 1928*

[The generalized probable error for differences in average yield of cane per acre among the different varieties =± 0.78 ton]

Variety	Acre yield of cane (tons) [1]											
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Average
P. O. J. 36	25.95	34.35	32.31	38.10	29.85	29.47	32.13	24.30	34.25	32.09	32.83	31.42
P. O. J. 36-M	29.49	31.43	30.14	38.42	30.78	25.51	28.71	24.05	32.28	32.65	30.52	30.36
P. O. J. 213	31.12	34.57	31.61	29.55	29.82	30.58	31.19	30.50	31.05	29.61	34.42	31.27
P. O. J. 228	27.20	26.41	31.13	29.83	30.25	28.56	27.28	21.78	32.23	28.06	28.54	28.30
P. O. J. 234	26.99	25.53	24.02	24.08	26.78	24.03	24.44	26.34	23.66	-------	21.36	24.72
P. O. J. 826	32.43	29.92	27.50	34.67	26.86	33.00	29.50	29.72	29.58	-------	31.47	30.46
P. O. J. 979	21.89	27.17	25.41	25.86	22.37	24.23	25.08	30.80	28.21	26.61	24.87	25.68

Variety	Laboratory-mill juice analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses Oct. 26 [2]			Preliminary analyses Nov. 12			Harvest analyses Dec. 5					
	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Per ton of cane	Per acre	
										Lbs.	*Lbs.*	*Tons*
P. O. J. 36	13.3	9.20	69.17	14.35	10.36	71.85	15.67	11.97	76.39	153.3	4,817	13.0
P. O. J. 36-M	15.1	11.29	74.77	15.50	12.08	77.94	16.27	12.92	79.49	169.7	5,152	11.8
P. O. J. 213	13.2	8.48	64.24	14.80	11.58	78.24	15.56	12.28	78.92	160.5	5,019	12.5
P. O. J. 228	13.7	8.92	65.11	14.65	10.56	72.08	15.24	10.73	70.41	130.1	3,682	15.4
P. O. J. 234	15.4	11.59	75.26	15.80	12.43	78.67	16.67	13.74	82.42	184.3	4,556	10.9
P. O. J. 826	13.7	9.29	67.81	13.50	9.13	67.63	14.92	10.86	72.79	134.7	4,103	14.8
P. O. J. 979	13.6	8.65	63.60	14.75	10.64	72.14	15.38	11.06	71.91	136.1	3,495	14.7

[1] Tons of 2,000 pounds. [2] Single sample of 5 stools each.

TABLE 6.—*Results of plant-cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1928*

Variety	Average acre yield of cane	Laboratory-mill juice analyses						Indicated available 96° sugar		Cane for 1 ton of sugar
		Preliminary analyses Nov. 1			Harvest analyses Dec. 10			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons							*Pounds*	*Pounds*	*Tons*
P. O. J. 36	20.30	13.0	8.28	63.69	15.52	11.93	76.87	153.6	3,118	13.0
P. O. J. 36-M	18.66	14.6	10.33	70.76	16.17	12.90	79.79	169.8	3,168	11.8
P. O. J. 213	20.28	13.0	8.20	63.08	15.22	12.19	80.09	160.7	3,259	12.4
P. O. J. 228	15.58	14.0	9.29	66.36	15.00	11.27	75.13	142.9	2,226	14.0
P. O. J. 234	18.76	15.6	12.03	77.12	16.35	13.73	83.08	185.9	3,487	10.8
P. O. J. 979	14.75	14.6	9.84	67.40	15.48	11.33	73.13	141.0	2,080	14.2
P. O. J. 2714	21.56	12.2	6.66	54.59	13.93	10.55	75.73	134.6	2,902	14.9
P. O. J. 2725	17.02	14.1	9.39	66.60	15.65	12.13	77.50	156.9	2,670	12.7
P. O. J. 2727	16.13	13.3	8.43	61.09	15.27	10.99	71.99	135.3	2,182	14.8

DISCUSSION OF RESULTS

The results corroborate, in general, conclusions from previous experiments.[8, 9] Generally speaking, P. O. J. 213 continues to lead in point of tonnage and calculated sugar yield per acre, though at

[8] RANDS, R. D., and SHERWOOD, S. F. Op. cit.
[9] RANDS, R. D., SHERWOOD, S. F., and STEVENS, F. D. Op. cit.

Houma (Table 2) and Cypremort (Table 5) P. O. J. 36–M shows a slight and perhaps insignificant lead in calculated sugar per acre. In comparing these two varieties as plant cane, it may be said that, in general, P. O. J. 213 shows a significantly greater tonnage with no significant difference in chemical analysis. There are indications, however, that in the western part of the sugar belt (Tables 5 and 6) the canes of the P. O. J. 36 and 36–M types do relatively better, and in that section P. O. J. 36–M plant cane seemed to give higher yields of sugar per ton of cane than P. O. J. 213, though with lower yields of cane per acre.

P. O. J. 234 continues to lead in calculated sugar per ton of cane, but its low cane yield brings it down to third place in point of calculated sugar per acre for the whole cane belt, though it ranks first at Erath in this respect.

P. O. J. 36, while giving satisfactory cane yields, again showed disappointingly low sugar content. At Cypremort (Table 5) it made a relatively good showing and compared favorably with P. O. J. 213 and P. O. J. 36–M.

In plant-cane tests carried on at the United States Sugar-Plant Field Station at Houma (Table 2), C. P. 177 and C. P. 807 showed considerably lower sugar percentage and purity than in tests carried on in 1926–27. However, both gave higher yields in 1928 than in 1927, with the result that the indicated sugar yields per acre compared favorably with those of previous years. C. P. 177 has a larger barrel than C. P. 807 and showed a more desirable type of growth, but proved to be a weaker yielder, with indications of late maturity. C. P. 177 has held its own for two years, under similar conditions of growth and ripening, with both P. O. J. 36–M and P. O. J. 213 from the standpoint of sugar production per acre. From the same standpoint C. P. 807, under the adverse warm and wet September and October ripening season of 1928 at Houma, has shown a production of 6,485 pounds of 96° sugar per acre, even with a relatively low sucrose and purity. Under the more favorable ripening season of 1927, C. P. 807 showed sucrose 12.15, purity 79.7. It took 12.5 tons of cane to make 2,000 pounds of sugar. In 1928 the sucrose was 10.18 per cent, purity 73.66. Fifteen and seven-tenths tons were required to give 2,000 pounds of sugar. But the effect of local conditions of ripening at Houma are apparent in all canes in the 1928 harvest, and consideration of the results should be from a comparative standpoint for the year, not for past years.

In the 1928 test at Houma the calculated quantity of C. P. 807 necessary to produce 1 ton of sugar was 15.7 tons, while the calculated quantity of P. O. J. 213 required to accomplish the same result was 15.3 tons. In the same test, C. P. 71–B, though a weaker yielder than C. P. 177 and C. P. 807, proved comparatively richer in sucrose, the calculated quantity necessary to produce 1 ton of sugar amounting to 13.2 tons.

Co. 281 made a very poor showing as to yield. This was due largely to the light, scattered stand which resulted from the thin planting resorted to on account of the scanty supply of seed cane. The thin stand in addition to depressing the cane yield had the effect of inducing abnormally late suckering, which undoubtedly made for a low sucrose content for this variety. Analyses for November 16 and December 13, however, showed it to be the equal of P. O. J. 213 in

percentage of sucrose and purity. This variety, however, is characterized by excessively late suckering under normal conditions. The stalks approximate those of P. O. J. 213 in size and are very erect. These characteristics, together with the fact that it is comparatively easy to strip, would tend to reduce harvesting and handling costs, and indicate that this cane would be a desirable one from a mechanical harvesting standpoint. It is somewhat brittle and might be subject to considerable breakage under severe windstorm conditions.

The results of this year's tests, together with information available from previous ones, indicate that the varieties P. O. J. 228, P. O. J. 826, P. O. J. 979, P. O. J. 2714, P. O. J. 2727, C. P. 123, and U. S. 1444, because of their late-maturing and other undesirable qualities, can not compete with the released varieties, and they are being eliminated from the coming plant-cane tests, though stubble observations will be continued. P. O. J. 2725, while showing a fair performance at Erath, was a disappointing failure at Greenwood. Because of the fact that this variety as yet has been inadequately tested, it will be included in replicated test plantings for at least another year.

In order to help to interpret the results of the various tests, rainfall records for the various test fields covering the three fall months were assembled and are summarized in Table 7. It will be noted that rainfall conditions for Houma and Greenwood were very similar. Frequent showers occurred, particularly during September and October. During the three fall months there were 27 rainy days at Houma and 23 at Greenwood. This condition undoubtedly accounts, in a large measure, for the excessively low sugar contents observed at the two places.

At Raceland an abnormally heavy rainfall occurred during the period, but most of it fell early in September in a relatively few days, and conditions there were more comparable to those obtaining at Erath and Cypremort.

TABLE 7.—*Amount and distribution of rainfall during the three fall months at the five test fields, with the calculated available sugar per ton of cane for the different varieties of sugarcane*

Station	September rainfall		October rainfall		November rainfall		Total rainfall for 3 months		Calculated available 96° sugar per ton of cane					
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	P. O. J. 36	P. O. J. 36–M	P. O. J. 213	P. O. J. 228	P. O. J. 234	P. O. J. 979
									Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
Erath	7	3.95	0	0	3	1.90	10	5.85	153.6	169.8	160.7	142.9	185.9	141.1
Cypremort	8	6.75	2	.50	2	1.25	12	8.50	153.3	169.7	160.5	130.1	184.3	136.5
Raceland	8	10.26	4	2.52	3	1.94	15	14.72	146.6	165.5	167.2	143.4	185.5	150.0
Greenwood	12	7.28	7	3.02	4	1.65	23	11.95	110.8	128.7	132.5	102.3	158.4	109.8
Houma	11	8.04	13	6.01	3	2.16	27	16.21	111.2	130.4	130.7	-------	-------	------

It is interesting to note in this connection that sugar-calculation results for the various varieties are, in general, very consistent for places of corresponding rainfall conditions.

The opinion prevails among factory men that, in general, sugarcane from the western part of the cane belt is higher in sugar than that from parishes east of the Atchafalaya River. This is presumably due, in part at least, to a lesser rainfall during the fall months, which induces ripening, and to the longer growing season found at certain places in St. Mary Parish, because of the protection afforded by Grand Lake from the north wind, which generally prevails at times of critically low temperatures. In view of the above-mentioned conditions it is easily conceivable that a given variety may show preferential adaptability with respect to the two sections. For this reason, results of the five plant-cane variety tests reported on are summarized by section in Table 8, in which is also given a general summary of all tests.

It will be observed that, though cane yields in the western section are lower, due in part to results at Erath (Table 11), where delayed spring cultivation resulted in generally depressed cane yields, comparative variety cane-yield averages show, in general, a common trend for both sections, Sugar-yield calculations indicate a higher sugar yield per ton of cane for the western section, though differences in this respect between the two sections were undoubtedly exaggerated by the fall weather conditions prevailing at Houma and Greenwood, as previously pointed out. In the western section, P. O. J. 36 showed up relatively better than in the eastern section, and P. O. J. 234 and 36–M practically equaled the performance of P. O. J. 213 in point of calculated sugar per acre.

TABLE 8.—*Comparison of average cane yields and indicated sugar yields from plant cane of various varieties in the eastern and western test fields, and general average for all experiments*

Variety	Eastern results (average of Houma, Raceland, and Greenwood tests) [1]			Western results (average of Cypremort and Erath tests)			General results (average of all tests) [1]		
	Cane per acre	Calculated available 96° sugar		Cane per acre	Calculated available 96° sugar		Cane per acre	Calculated available 96° sugar	
		Per ton of cane	Per acre		Per ton of cane	Per acre		Per ton of cane	Per acre
	Tons	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*	*Tons*	*Pounds*	*Pounds*
P. O. J. 36	31.28	122.9	3,844	25.86	153.4	3,967	29.11	135.1	3,933
P. O. J. 36–M	32.36	141.5	4,579	24.51	169.7	4,159	29.22	152.8	4,465
P. O. J. 213	34.97	143.5	5,018	25.77	160.6	4,139	31.29	150.3	4,703
P. O. J. 228	29.99	122.8	3,683	21.94	136.5	2,995	25.96	129.7	3,367
P. O. J. 234	25.51	171.9	4,385	21.74	185.1	4,024	23.62	178.5	4,216
P. O. J. 826				[2] 30.46	134.7	4,103	30.46	134.7	4,103
P. O. J. 979	28.58	130.1	3,718	20.21	138.5	2,799	24.39	134.3	3,276
P. O. J. 2714				[3] 21.56	134.6	2,902	21.56	134.6	2,902
P. O. J. 2725	[4] 25.82	90.6	2,339	[3] 17.02	156.9	2,670	21.42	123.7	2,650
P. O. J. 2727				[3] 16.13	135.3	2,182	16.13	135.3	2,182

[1] Not weighted for local number of replications.
[2] Cypremort only.
[3] Erath only.
[4] Greenwood only.

TABLE 9.—*Results of mill tests on four important sugarcane varieties at the Godchaux sugar factory, Raceland, La., in 1928*

Variety	Cane milled	Juice analyses												Fiber in cane	Maceration [1]
		Crusher juice			Normal juice			Dilute juice			Residual juice				
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity		
	Tons													*P. ct.*	*P. ct.*
P. O. J. 36	15.70	15.14	11.63	76.82	14.67	10.77	73.40	11.84	8.69	73.40	8.36	5.65	67.58	11.34	21.33
P. O. J. 36-M	14.57	15.89	12.75	80.24	15.39	11.64	75.61	12.79	9.67	75.61	8.70	6.07	69.77	11.43	20.99
P. O. J. 213	17.48	15.74	13.20	83.86	15.25	12.10	79.34	12.44	9.87	79.34	9.10	6.51	71.54	12.73	19.75
P. O. J. 234	14.00	16.69	14.24	85.32	16.17	13.22	81.74	13.09	10.70	81.74	9.43	6.91	73.28	12.83	21.69

Variety	Normal extraction [2]	Sucrose extraction	Sucrose in cane	Yields of cane per acre [3]	Sucrose in cane per acre	96° sugar per ton of cane [4]	96° sugar per acre	Cane for 1 ton of sugar
			Per cent	*Tons*	*Pounds*	*Pounds*	*Pounds*	*Tons*
P. O. J. 36	79.31	93.19	9.17	28.11	5,155.4	149.10	4,191.2	13.41
P. O. J. 36-M	81.02	93.15	10.12	28.71	5,810.9	167.63	4,812.7	11.93
P. O. J. 213	76.71	92.11	10.07	32.63	6,573.7	169.64	5,537.0	11.79
P. O. J. 234	77.10	92.96	10.96	24.37	5,341.9	189.44	4,616.7	10.56

[1] Based on venturimeter readings.
[2] Based on weight of mixed juice less maceration water.
[3] See Table 3.
[4] 96° sugar yields based on actual extraction, Java formula; boiler-house efficiency, 98 per cent.

MILL TEST

In order to check the laboratory method of sugar-yield calculations, a mill test paralleling the laboratory procedure was conducted at the Godchaux sugar factory,[10] Raceland, La., on the four most important varieties in the Raceland test. Samples for the laboratory mill and cane for the mill were cut simultaneously. Laboratory samples were collected according to the method previously described (p. 4).

Table 9 summarizes the results of the mill test. The weight of the cane milled for each variety is based on car weights, which corresponded very closely to field weights. The mixed juice from each variety was weighed, and from this data the figures for "dilute extraction" were arrived at. The latter, when corrected for maceration water as measured by meter readings for each variety, formed the basis of calculated normal extractions. The accuracy of the meter, as based on trials of one hour's duration at the mill, may be expressed as 100 ± 0.06.

A comparison of the calculated sugar per ton of cane as determined by laboratory procedure on one hand and actual factory results on the other is given in Table 10. It will be observed that while laboratory sugar calculations are in every case slightly lower than results obtained from the mill test, the comparative results are remarkably consistent. Thus, from a standpoint of variety comparison, the laboratory method based on field sampling and generalized reduction factors for Brix and sucrose and extraction figures evolved as a result of a previous factory test are strikingly borne out by actual factory results where mill-juice samples were taken and actual extraction figures and local reduction factors were used.

[10] Acknowledgment is made of the cooperation received from the owners and from Horace Nelson, manager, and W. Bondurant, chief chemist, of the Godchaux factory.

TABLE 10.—*Comparison of results of sugar calculations on four varieties of sugarcane in the Raceland test based on laboratory and factory data*

Variety	Calculated 96° sugar per ton of cane based on—		Rank as to sugar per ton of cane (P. O. J. 234=100) based on—	
	Mill data	Laboratory data	Mill data	Laboratory data
	Pounds	*Pounds*	*Pounds*	*Pounds*
P. O. J. 213	169.64	167.2	89.55	90.13
P. O. J. 234	189.44	185.5	100.00	100.00
P. O. J. 36	149.10	146.6	78.71	79.03
P. O. J. 36-M	167.63	165.5	88.49	89.22

STUBBLE-CANE TEST

The results of a stubble-cane variety test conducted on the Caldwell plantation near Erath, La., are summarized in Table 11. In this test P. O. J. 213 is the outstanding variety, though P. O. J. 36 makes a rather good showing. P. O. J. 36–M, though showing good sucrose content, drops to seventh place in the test because of its low yield. In spite of the fact that both P. O. J. 213 and P. O. J. 36 show significantly higher cane yields than P. O. J. 36–M, actual differences in tonnage should not be taken literally, in view of the high plot variability, particularly of P. O. J. 36 and P. O. J. 36–M, which was due largely to irregular soil differences and which consequently made for a high experimental error. P. O. J. 228, P. O. J. 979, and P. O. J. 2379, though making a fair showing, apparently can not compete with P. O. J. 213, particularly in view of the universally poor showing made by these varieties as plant cane.

TABLE 11.—*Results of stubble-cane variety tests on light soil on the Caldwell plantation, Erath, La., in 1928*

Variety	Acre yield of cane (tons) [1]												
	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Average
P. O. J. 36	29.54	20.21	------	33.07	------	26.39	26.36	22.27	------	------	37.20	25.67	27.59±1.32
P. O. J. 36-M	------	25.41	------	------	------	19.68	19.71	------	------	------	------	19.14	20.99±1.00
P. O. J. 213	30.19	29.28	32.48	------	28.27	------	26.90	------	27.84	------	27.13	27.38	28.68±.46
P. O. J. 228	30.87	23.51	25.51	------	29.86	17.42	27.96	28.74	------	27.07	22.17	23.93	25.80±.87
P. O. J. 234	22.99	------	19.68	------	16.22	------	22.48	15.65	------	18.90	------	20.10	19.43±.72
P. O. J. 826	24.46	22.32	28.41	25.51	22.06	16.07	24.70	19.72	15.04	12.92	18.75	12.14	20.17±1.03
P. O. J. 979	------	22.84	------	------	------	27.27	------	------	22.10	------	------	23.91	24.03±.77
P. O. J. 2379	28.79	23.51	22.99	------	------	18.05	23.73	28.30	------	------	22.41	------	23.97±.93

Variety	Laboratory-mill juice analyses						Fiber in cane [4]	Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
	Preliminary analyses Nov. 1 [2]			Harvest analyses Nov. 6 [3]						
	Brix	Polarization	Purity	Brix	Polarization	Purity		Per ton of cane	Per acre	
							Per cent	*Pounds*	*Pounds*	*Tons*
P. O. J. 36	14.0	9.76	69.71	14.8	10.36	70.00	14.25	125.0	3,449	16.0
P. O. J. 36-M	15.5	11.27	72.71	15.34	11.07	72.16	13.75	136.5	2,865	14.7
P. O. J. 213	14.4	9.79	67.99	14.72	10.56	71.74	12.30	130.1	3,731	15.4
P. O. J. 228	14.2	9.48	66.76	14.36	9.74	67.83	------	114.8	2,962	17.4
P. O. J. 234	15.1	11.37	75.29	15.4	11.75	76.30	14.80	150.3	2,920	13.3
P. O. J. 826	13.5	8.97	66.44	13.74	9.72	70.04	------	118.1	2,382	16.9
P. O. J. 979	15.8	10.78	68.23	15.75	10.72	68.06	------	126.6	3,042	15.8
P. O. J. 2379	14.1	9.15	64.89	14.8	10.14	68.51	------	120.5	2,888	16.6

[1] Tons of 2,000 pounds
[2] Average of two 5-stool (approximately 50-stalk) samples.
[3] Average for samples of 5 stools each for each variety.
[4] Average of 2 determinations.

SEEDLING TESTING

During the past season 707 new seedlings from the department's sugarcane breeding station at Canal Point, Fla., were tested at the Houma station, and from these 87 were selected for increase and further testing. While observations, particularly chemical analyses, conducted on the necessarily limited scale possible during the first year of testing are certainly not reliable enough to be conclusive in view of the large experimental error, it may be pointed out that several of the selected seedlings show encouraging results.

Ten C. P. seedling varieties which had previously shown promise in nursery plantings were grown in one-sixtieth-acre plots. Chemical analyses and probable cane-yield and sugar-yield calculations were made on these, and the results are given in Table 12.

TABLE 12.—*Results of the 1928 plant cane "line test" on mixed soil at the United States Sugar-Plant Field Station, Houma, La.*

Variety	Indicated yield per acre	Chemical analyses									Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Oct. 19, 1928			Nov. 2, 1928			Nov. 15, 1928			Per ton of cane	Per acre	
		Brix	Sucrose	Purity	Brix	Sucrose	Purity	Brix	Sucrose	Purity			
	Tons										*Lbs.*	*Lbs.*	*Tons*
P. O. J. 213	36.82	11.59	7.18	61.95	13.10	9.13	69.69	13.82	10.34	74.82	130.7	4,812	15.3
C. P. 130	42.00	13.5	9.08	67.26	14.8	10.70	72.30	14.8	10.51	71.01	127.8	5,368	15.6
C. P. 727	42.39	10.8	5.23	48.43	13.2	7.98	60.46	13.4	8.06	60.15	85.7	3,633	23.3
C. P. 754	47.13	9.5	4.49	47.27	11.0	6.15	55.91	10.8	6.10	56.50	60.7	2,861	32.9
C. P. 758	53.23	11.3	6.23	55.13	12.2	7.09	58.12	13.3	8.18	61.51	88.8	4,727	22.5
C. P. 763	42.72	12.4	3.11	31.10	12.1	6.72	55.54	12.7	7.31	57.56	74.4	3,178	26.9
C. P. 766	52.95	12.8	7.95	62.11	14.8	10.30	69.60	15.72	11.35	72.20	140.0	7,413	14.3
C. P. 776	35.79	11.3	5.25	46.46	12.5	6.44	51.52	13.3	7.15	53.76	67.2	2,405	29.8
C. P. 777	46.29	11.2	5.47	48.74	11.7	6.80	58.12	12.9	7.61	58.99	79.3	3,671	25.2
C. P. 790	45.95	11.0	4.10	41.90	------	------	------	12.7	8.05	63.39	89.8	4,126	22.3
C. P. 810	46.41	12.3	7.64	62.12	13.6	9.31	68.46	14.5	10.35	71.39	126.7	5,880	15.8
U. S. 1557	30.98	11.17	6.54	58.55	12.9	8.35	64.73	14.4	10.15	75.49	123.2	3,817	16.2

It will be noted that C. P. 766, C. P. 130, and C. P. 810 are decidedly the most promising varieties in this group. C. P. 766 is a seedling from U. S. 1652, which is in turn a seedling from P. O. J. 213. It is an early germinating cane, showing excellent vigor, and so far has not proved susceptible to mosaic. The stalks are between P. O. J. 213 and P. O. J. 36 in size and are comparatively erect. Very little lodging was observed.

C. P. 130, a seedling of Okinawa-Tekcha × F. M. 3, germinates comparatively late. So far it has not shown indications of mosaic infection. This cane, while having a stalk about equal to that of P. O. J. 36 in size, is subject to severe lodging.

DATE-OF-PLANTING TESTS

Inasmuch as P. O. J. 213 is at present the logical variety to use as the standard for comparison in Louisiana, two date-of-planting experiments, one at the United States Sugar-Plant Field Station at Houma and the other on Mary plantation, near Raceland, La., were con-

ducted with this variety. Summaries of the two tests are embodied in Tables 13 and 14.

Study of the data presented in Table 13 indicates that the earlier planted plots showed, in general, a considerably greater number of stalks on April 14. Stalk counts made on August 10, however, show that while differences in number of stalks still existed in favor of earlier planting, the differences were comparatively less than earlier in the season. The number of stalks at harvest, as indicated by figures obtained from an actual count of one plot in each planting date series, followed proportionately the counts of August 10, with a shrinkage due to a certain amount of stalk mortality. Average yields of cane appear to follow, in general, the average number of stalks per acre on August 10.

TABLE 13.—*Results of date-of-planting tests with P. O. J. 213 plant cane on mixed soil at the United States Sugar-Plant Field Station, Houma, La.*

[Plots were one-twentieth of an acre, having rows 5½ feet wide]

Date planted	Plot No.	Average number of stalks per acre			Average yield per acre	Chemical analyses Nov. 26, 1928			96° sugar		Cane for 1 ton of sugar
		Apr. 14, 1928	Aug. 10, 1928	Harvested		Brix	Sucrose	Purity	Per ton	Per acre	
					Tons				*Pounds*	*Pounds*	*Tons*
Oct. 4, 1927	1	12,980	61,780	--------	45.97	15.75	12.94	--------	--------	--------	--------
	2	16,720	55,080	--------	37.84	15.10	12.25	--------	--------	--------	--------
	3	15,920	59,360	--------	42.95	14.65	11.46	--------	--------	--------	--------
	4	13,780	62,640	--------	(1)	15.05	11.99	--------	--------	--------	--------
	5	15,640	63,120	49,500	41.53	15.20	12.24	--------	--------	--------	--------
Average	------	15,008	60,396	--------	42,07	15.15	12.18	80.39	161.0	6,773	12.4
Oct. 17, 1927	1	10,580	64,520	--------	45.38	15.55	12.63	--------	--------	--------	--------
	2	7,800	56,620	--------	43.03	15.10	11.79	--------	--------	--------	--------
	3	10,040	56,600	--------	38.98	15.15	12.25	--------	--------	--------	--------
	4	7,120	54,580	--------	(1)	14.45	11.44	--------	--------	--------	--------
	5	9,100	61,640	46,920	40.99	15.00	11.96	--------	--------	--------	--------
Average	------	8,928	58,792	--------	42.09	15.05	12.01	79.80	158.0	6,650	12.7
Nov. 1, 1927	1	8,220	62,380	--------	43.74	13.65	9.70	--------	--------	--------	--------
	2	5,500	57,860	--------	39.64	13.90	9.84	--------	--------	--------	--------
	3	6,040	56,280	--------	36.84	14.50	10.99	--------	--------	--------	--------
	4	4,240	48,700	--------	(1)	14.60	11.46	--------	--------	--------	--------
	5	3,500	46,480	40,640	35.57	14.00	10.49	--------	--------	--------	--------
Average	------	5,500	54,340	--------	38.95	14.13	10.50	74.31	132.2	5,149	15.1
Nov. 15, 1927	1	7,260	58,860	--------	39.28	13.90	10.37	--------	--------	--------	--------
	2	6,660	58,960	--------	40.90	14.55	10.98	--------	--------	--------	--------
	3	6,320	64,180	--------	43.70	14.10	10.43	--------	--------	--------	--------
	4	7,180	58,520	--------	(1)	14.50	11.13	--------	--------	--------	--------
	5	7,420	54,460	44,300	37.10	13.90	10.56	--------	--------	--------	--------
Average	------	6,968	58,996	--------	40.24	14.19	10.69	75.33	135.6	5,457	14.7
Dec. 6, 1927	1	4,540	50,060	--------	39.11	14.45	11.08	--------	--------	--------	--------
	2	3,560	47,500	--------	35.46	13.25	9.50	--------	--------	--------	--------
	3	2,240	44,460	--------	34.88	13.45	9.42	--------	--------	--------	--------
	4	4,880	52,120	--------	(1)	13.50	9.42	--------	--------	--------	--------
	5	4,560	55,020	42,580	37.30	13.85	10.21	--------	--------	--------	--------
Average	------	3,956	49,832	--------	36.69	13.70	9.93	72.48	123.0	4,513	16.3

[1] Plot No. 4 was left standing for deterioration observations, and final yields are not comparable.

TABLE 14.—*Results of date-of-planting tests with P. O. J. 213 plant cane on light soils at the Mary plantation, Raceland, La.*

Date of planting (1927)	Average yield per acre of—					Laboratory-mill results (samples collected and ground Dec. 15)						Factory results (harvested and ground Dec. 28)					
						Juice analyses			Calculated available 96° sugar [1]		Cane for 1 ton of sugar	Normal juice analyses			Calculated available 96° sugar [2]		Cane for 1 ton of sugar
	Plot 1	Plot 2	Plot 3	Plot 4	Average	Brix	Sucrose	Purity	Per ton of cane	Per acre		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons	*Tons*	*Tons*	*Tons*	*Tons*				*Lbs.*	*Lbs.*	*Tons*				*Lbs.*	*Lbs.*	*Tons*
Sept. 10	25.02	22.76	22.78	23.83	23.60	15.10	12.67	83.91	171.7	4,052	11.65	14.57	12.08	82.91	173.2	4,088	11.55
Sept. 22	26.67	23.49	25.68	23.71	24.89	15.25	12.84	84.20	174.1	4,333	11.49	14.94	12.57	84.13	181.7	4,523	11.01
Oct. 5	27.83	25.61	26.87	27.80	27.03	15.20	12.51	82.30	167.6	4,529	11.93	14.72	12.05	81.86	171.5	4,634	11.66
Oct. 17	27.79	24.68	26.72	25.56	26.19	14.70	11.80	80.27	155.9	4,081	12.83	14.74	11.92	80.87	168.6	4,414	11.86
Oct. 29	26.35	27.81	27.38	26.17	26.93	14.40	11.52	80.00	152.0	4,092	13.16	14.33	11.65	81.30	165.2	4,447	12.11

[1] Winter-Carp formula, extraction 78 per cent, B. H. E. 100 per cent.
[2] Winter-Carp formula, extraction 75 per cent, B. H. E. 100 per cent, Godchaux sugar factory.

The sucrose content, as would be expected in view of a greater proportion of older stalks, is generally higher for the earlier plantings.

While later plantings generally show a considerable decrease in number of stalks per acre, in average cane yield per acre, and in sucrose content, there seems to be a slight exception in the case of November 15 plantings. In plots of this series the values are higher than in the case of November 1 plantings, though considerably less than in October 4 and October 17 plots. This slight reversal may have been due to slight differences in seed cane, but this is not likely, because special effort was made to procure uniform seed. It is more probable that unfavorable weather conditions (a freeze on November 8 and 3.15 inches of rain on November 16) affected the November 1 series more adversely than they did the others.

Judging from the results of these two tests it appears that P. O. J. 213 responds favorably to early planting, particularly with reference to cane maturity. Apparently this variety should be planted early enough to permit it to get fairly well established in the fall. However, the date of planting should not be so early that excessive growth will take place in the fall, because this would probably result in a poor stand in the spring, as illustrated by the September 10 planting in the Mary plantation test. The results indicate that, under the conditions prevailing at the two test stations during the 1927–28 crop season, the best time to plant P. O. J. 213 was between September 20 and October 20, with an optimum during the first part of October. Inasmuch as the fall of 1927 was a rather typical one, the results as shown by these experiments would probably apply generally to the light and mixed soils of the southeastern parishes, though it is to be expected that somewhat different results would be obtained under different weather conditions at different localities or at the same locality on different soils.

SUMMARY AND CONCLUSIONS

With respect to P. O. J. 213, the results of the 1927–28 tests agree with those from the 1925–26 and 1926–27 tests in that this variety continues to be the leading one from the standpoint of general suitability for culture and calculated yields of sugar per acre. The

results of date-of-planting tests show that it responds favorably to comparatively early planting.

P. O. J. 213 has afforded uniformly satisfactory results in both experimental and large-scale plantings, and it is believed that it is entitled to primary consideration in the planting program, and that, in general, the greater percentage of the acreage at present should be planted in this variety. However, the proportion of the acreage to be allotted to each variety will necessarily depend upon conditions such as location, type of soil, and probable length of grinding season, and will be subject to variation in different localities and upon different plantations.

P. O. J. 234 leads in yield of sugar per ton of cane, but its comparatively lower yields of cane, poor stubbling qualities, and somewhat greater susceptibility to mosaic render it less desirable for extensive planting. These undesirable qualities are offset to a considerable extent by its very desirable quality of ripening early, and this characteristic appears to entitle it to a place, though a minor one, in the planting program, particularly where an early and prolonged grinding season is contemplated. Early cutting is particularly detrimental to this variety. If, however, the plant cane is left standing until late in the season, a comparatively good stubble crop can be expected the following year, and this will afford fairly ripe cane for early grinding.

P. O. J. 36, largely on account of its late-maturing qualities, continues to show low sucrose and purity, except in those localities in which conditions favor early ripening. It afforded good results in the western part of the sugar belt and appears to be best adapted to culture in this section. The results thus far obtained indicate that it should be confined to relatively small-scale plantings except in those localities in which conditions are known to favor early ripening.

P. O. J. 36–M, while giving practically the same cane yields as P. O. J. 36, showed significantly earlier maturity and greater yields of sugar per acre than the latter. In several of the tests it compared favorably with P. O. J. 213. The results of comparative trials of P. O. J. 36–M by all of the agencies cooperating in trials of sugarcane varieties in Louisiana indicate the desirable qualities of this variety as compared with the varieties now being grown commercially, and justify its release for general distribution and commercial culture in the State.

The stubbling qualities of P. O. J. 36 and P. O. J. 36–M appear to be somewhat inferior to those of P. O. J. 213, though insufficient evidence exists to permit of definite conclusions being drawn.

P. O. J. 228, P. O. J. 826, P. O. J. 979, P. O. J. 2379, P. O. J. 2714, P. O. J. 2727, C. P. 123, and U. S. 1444 apparently can not compete with the varieties that have been released for general planting, on account of their late-maturing qualities and other undesirable characteristics.

Several other varieties, including Co. 281, P. O. J. 2725, and some of the C. P. seedlings, in particular C. P. 71–B, C. P. 130, C. P. 177, C. P. 766, and C. P. 807, have shown considerable promise on the basis of limited tests. Some of these varieties have undesirable characteristics, however, and more extensive trials will be necessary before any definite conclusions can be reached with regard to their value as compared with the released varieties, P. O. J. 36, P. O. J. 213, and P. O. J. 234.

Initial tests were made on 707 new seedling varieties bred at the sugarcane breeding station of the United States Department of Agriculture at Canal Point, Fla., and 87 of them were selected for increase and further testing.

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